

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Divisional Application of )  
VOIT et al. )  
Serial No.: TO BE ASSIGNED )  
Filed: WITH DIVISIONAL APPLICATION )  
For: HYDROGENATION CATALYST )

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to initial examination of the above-identified divisional application, kindly  
amend the application as follows.

IN THE SPECIFICATION

Page 1, after the title, insert the paragraph:

-- This application is a divisional application of Serial No. 09/622,773, filed August 23,  
2000.--

IN THE CLAIMS

Please cancel claims 1 - 20 and enter new claims 21-25.

--21. A hydrogenation catalyst comprising

- (a) iron or a compound based on iron or mixtures thereof,
- (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4  
or 5 elements selected from the group consisting of aluminum, silicon,  
zirconium, titanium and vanadium,

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(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and also

(d) from 0.001 to 1% by weight based on (a) of manganese.

22. A hydrogenation catalyst, as claimed in claim 21, obtainable by reduction with or without subsequent passivation of a magnetite.
23. A hydrogenation catalyst, as claimed in claim 21, obtainable by precipitating precursors of said components (a), (b), (d) and optionally (c) in the presence or absence of support materials.
24. A hydrogenation catalyst, as claimed in claim 21, obtainable by impregnating a support with a solution of said components (a), (b), (d) and optionally (c).
25. A hydrogenation catalyst, as claimed in claim 21, obtainable by spraying said components (a), (b), (d) and optionally (c) onto a support.--

**CLEAN VERSION OF AMENDED CLAIMS**

21. A hydrogenation catalyst comprising
- (a) iron or a compound based on iron or mixtures thereof,
  - (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,
  - (c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and also
  - (d) from 0.001 to 1% by weight based on (a) of manganese.
22. A hydrogenation catalyst, as claimed in claim 21, obtainable by reduction with or without subsequent passivation of a magnetite.
23. A hydrogenation catalyst, as claimed in claim 21, obtainable by precipitating precursors of said components (a), (b), (d) and optionally (c) in the presence or absence of support materials.
24. A hydrogenation catalyst, as claimed in claim 21, obtainable by impregnating a support with a solution of said components (a), (b), (d) and optionally (c).
25. A hydrogenation catalyst, as claimed in claim 21, obtainable by spraying said components (a), (b), (d) and optionally (c) onto a support.

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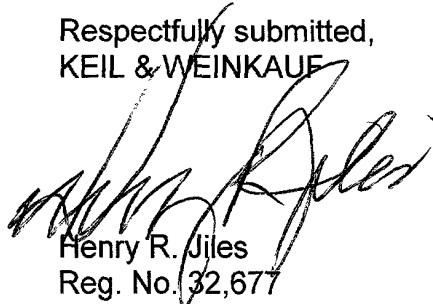
Remarks

Claims 21 to 25 are pending in this Divisional application.

Upon entry of the foregoing amendment, the claims are limited to the invention which stood nonelected in the applicants' parent application. An action on the merits is solicited.

To the extent necessary, applicant(s) petition for an Extension of Time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit any excess fees to such deposit account.

Respectfully submitted,  
KEIL & WEINKAUF



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

[1.(canceled) A process for producing alpha, omega-aminonitriles and alpha, omegadiamines by the hydrogenation of alpha, omega-dinitriles in the presence a catalyst, which comprises using a catalyst comprising

- (a) iron or a compound based on iron or mixtures thereof,
- (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,
- (c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and also
- (d) from 0.001 to 1 % by weight based on (a) of manganese.

2.(canceled) A process as claimed in claim 1, wherein the catalyst has a BET surface area of from 3 to 20 M2/g , a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 pm and a 0.01 to 0.1 pm pore volume fraction within the range from 50 to 70%.

3.(canceled) A process as claimed in claim 1, wherein the catalyst is obtained by reduction with or without subsequent passivation of a magnetite.

4.(canceled) A process as claimed in claim 1, wherein a promoter (b) based on aluminum, silicon and titanium is used.

5.(canceled) A process as claimed in claim 1, wherein a promoter (c) based on magnesium and/or calcium is used.

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6.(canceled) A process as claimed in claim 1, wherein the hydrogenation is effected in a fixed bed reactor.

7.(canceled) A process as claimed in claim 1, wherein the catalyst is an unsupported catalyst.

8.(canceled) A process as claimed in claim 1, wherein the alpha, omega-dinitrile is hydrogenated to an alpha, omega-diamine.

9.(canceled) A process as claimed in claim 8, wherein the alpha, omega-dinitrile used is adiponitrile to obtain hexamethylenediamine.

10.(canceled) A process as claimed in claim 1, wherein the alpha, omega-dinitrile is hydrogenated to an alpha, omega-aminonitrile.

11.(canceled) A process as claimed in claim 10, wherein alpha, omega-dinitrile used is adiponitrile to obtain 6-aminocapronitrile.

12.(canceled) A process as claimed in claim 1, wherein the alpha, omega-dinitrile used was obtained by hydrocyanation of an alpha, omega-diene having two fewer carbons than the resulting alpha, omega-dinitrile, in the presence of phosphorus catalysts.

13.(canceled) A process as claimed in claim 12, wherein the weight fraction of phosphorus compound in the resulting alpha, omega-dinitrile is reduced.

14.(canceled) A process as claimed in claim 12, wherein the weight fraction of phosphorus compound is less than 5 ppm, based on alpha, omega-dinitrile, after reduction in the level of phosphorus compounds.

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

15.(canceled) A process as claimed in claim 12, wherein the weight fraction of phosphorus compound is less than 1 ppm, based on alpha, omega-dinitrile, after reduction in the level of phosphorus compounds.

16.(canceled) The use of materials as set forth in claim 1 as catalysts in the hydrogenation of alpha, omega-dinitriles.

17.(canceled) A material as set forth in claim 1, obtainable by reduction with or without subsequent passivation of a magnetite.

18.(canceled) A material as set forth in claim 1, obtainable by precipitating precursors of said components (a), (b), (d) and optionally (c) in the presence or absence of support materials.

19.(canceled) A material as set forth in claim 1, obtainable by impregnating a support with a solution of said components (a), (b), (d) and optionally (c).

20.(canceled) A material as set forth in claim 1, obtainable by spraying said components (a), (b), (d) and optionally (c) onto a support.]

**NEWLY ADDED CLAIMS**

21.(Newly added)A hydrogenation catalyst comprising

- (a) iron or a compound based on iron or mixtures thereof,
- (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium.

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- (c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and also
- (d) from 0.001 to 1% by weight based on (a) of manganese.

22.(Newly added) A hydrogenation catalyst, as claimed in claim 21, obtainable by reduction with or without subsequent passivation of a magnetite.

23.(Newly added) A hydrogenation catalyst, as claimed in claim 21, obtainable by precipitating precursors of said components (a), (b), (d) and optionally (c) in the presence or absence of support materials.

24.(Newly added) A hydrogenation catalyst, as claimed in claim 21, obtainable by impregnating a support with a solution of said components (a), (b), (d) and optionally (c).

25.(Newly added) A hydrogenation catalyst, as claimed in claim 21, obtainable by spraying said components (a), (b), (d) and optionally (c) onto a support.



Claims as filed in Divisional of Voit et al., Serial No. 09/622,773, OZ 0050/48839/CI

21. A hydrogenation catalyst comprising
  - (a) iron or a compound based on iron or mixtures thereof,
  - (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,
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25. A hydrogenation catalyst, as claimed in claim 21, obtainable by spraying said components (a), (b), (d) and optionally (c) onto a support.